AMENDMENTS TO THE CLAIMS

1-20. (Canceled)

21. (Currently amended) A sensing device for sensing a specific binding between an analyte and a recognition molecule, the sensing device comprising:

a ~~sensor comprising a~~ patterned, localized, and individually addressable microelectronic sensor, the sensor ~~micro-electronically addressable sensor surface, the sensor surface~~ comprising an individually addressable activation element and a plurality of self-aligned recognition ~~molecule and an activation element~~ molecules covalently bound to a sensor surface comprising an anchoring layer, wherein the activation element is a thermal activation element configured to adjust a temperature of a part of the anchoring layer and the anchoring layer's immediate surroundings by heating or cooling or is an electrochemical activation element configured to adjust an oxidation state of a part of the anchoring layer through a locally applied voltage or current, wherein the part of the anchoring layer has an area of less than 1 mm^2, wherein a volume of part of the anchoring layer's immediate surroundings, measured as extending into a space accessible by the recognition molecules, is less than 1 mm^3, ~~selected from the group consisting of an individually addressable thermal activation element and an individually addressable electrochemical activation element, wherein the activation element is configured to activate the sensor surface, wherein the recognition molecule is covalently bound to the sensor surface,~~ and wherein the sensor is configured to electrically detect or electrically sense a specific binding between the recognition ~~molecule~~ molecules and an analyte.

22. (Previously presented) The sensing device of claim 21, wherein the sensing device is a field effect transistor.

23. (Previously presented) The sensing device of claim 21, comprising a plurality of micro-electronically individually addressable sensor surfaces, wherein each sensor surface is individually activatable.

24. (Currently amended) The sensing device of claim 21, comprising a plurality of ~~micro-electronically~~ patterned, localized, and individually addressable microelectronic sensors.

25. (Canceled)

26. (Currently amended) The sensing device of claim ~~25~~ 21, wherein the anchoring layer is selected from the group consisting of chemical molecules and a metal layer.

27. (Currently amended) The sensing device of claim ~~25~~ 21, wherein the anchoring layer is activatable by electrochemical actuation.

28. (Previously presented) The sensing device of claim 21, wherein the activation element is an electrochemical activation element.

29. (Previously presented) The sensing device of claim 28, wherein the sensor surface comprises a surface layer, the surface layer comprising a material configured to allow electron transfer over the surface layer.

30. (Previously presented) The sensing device of claim 29, wherein the material is selected from the group consisting of a metal, a thin oxide, a semiconductor, an organic layer, and combinations thereof.

31. (Previously presented) The sensing device of claim 21, wherein the activation element is a thermal activation element.

32. (Previously presented) The sensing device of claim 21, wherein the thermal activation element is selected from the group consisting of a resistor, a microwave heatable element, and a peltier element.

33-40. (Canceled)

41. (New) The sensing device of claim 21, wherein the device is a microelectronic chip.

42. (New) A method for preparing a sensing device, comprising:

providing an activation element configured to activate a sensor surface having an anchor layer, wherein the activation element is a thermal activation element configured to adjust a temperature of a part of the anchoring layer and the anchoring layer's immediate surroundings by heating or cooling or is an electrochemical activation element configured to adjust an oxidation state of a part of the anchoring layer through a locally applied voltage or current, wherein the part of the anchoring layer has an area of less than 1 mm^2, wherein a volume of the part of the anchoring layer's immediate surroundings, measured as extending into a space accessible by the recognition molecules, is less than 1 mm^3;

activating the sensor surface via the activation element; and

adsorbing, depositing, or desorbing a plurality of recognition molecules onto the sensor surface in a pattern, wherein the recognition molecules are self-aligned and covalently bound to the sensor surface, whereby a sensing device comprising a patterned, localized, and individually addressable microelectronic sensor is obtained, wherein the sensor is configured to electrically detect or electrically sense a specific binding between the recognition molecules and an analyte.

43. (New) A method as recited in claim 42, wherein the recognition molecules are biomolecules.

44. (New) A method as recited in claim 42, comprising repeating steps of providing, activating, and adsorbing, depositing, or desorbing so as to obtain a plurality of patterned, localized and individually addressable microelectronic sensors.

45. (New) A method as recited in claim 42, wherein the recognition molecules are deposited from a liquid phase or a vapor phase onto the sensor surface.

46. (New) A method as recited in claim 42, wherein activating is conducted before adsorbing, depositing, or desorbing.

47. (New) A method as recited in claim 42, further comprising selecting a sensor surface, wherein selecting is conducted before activating.

48. (New) A method as recited in claim 42, wherein the device is a micro-electronic chip.

49. (New) A method as recited in claim 42, wherein activation is activation by laser light.

50. (New) A method for detecting an analyte, comprising:

providing a sensing device, the sensing device comprising a patterned, localized, and individually addressable microelectronic sensor, the sensor comprising an individually addressable activation element and a plurality of self-aligned recognition molecules covalently bound to a sensor surface comprising an anchoring layer, wherein the activation element is a thermal activation element configured to adjust a temperature of a part of the anchoring layer and the anchoring layer's immediate surroundings by heating or cooling or is an electrochemical activation element configured to adjust an oxidation state of a part of the anchoring layer through a locally applied voltage or current, wherein the part of the anchoring layer has an area of less than 1 mm^2, wherein a volume of the part of the anchoring layer's immediate surroundings, measured as

extending into a space accessible by the recognition molecules, is less than 1 mm^3, and wherein the sensor is configured to electrically detect or electrically sense a specific binding between the recognition molecules and an analyte; and

electrically detecting a binding event between the recognition molecule and an analyte, wherein detection of the binding event is indicative of a presence of the analyte.